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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/408,921 09/30/99 RICCI

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IM52/0806

EXAMINER

BUEKER, R

ART UNIT	PAPER NUMBER
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1763

DATE MAILED:

08/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/408,921

Applicant(s)

Ricci et al

Examiner

R Bueker

Group Art Unit

1763

paper no. 8

8-6-01

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

P riod for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 10-2-01
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-18 + 38-39 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-18 + 38-39 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
 - ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 7
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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Claims 1-18 and 38-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 7, the phrase "the at least one distribution groove" is vague and indefinite because it lacks proper antecedent basis. In claims 13-15, the phrase "a plasma-based fabrication apparatus as recited in claim 11" is vague and indefinite because claim 11 does not recite a plasma-based fabrication apparatus. Claims 16-18 share this problem because they depend from claim 15.

In claim 1, the phrase "a portion being substantially nonreactive to the process chemistry used" is vague and indefinite, because it defines the gas distributor plate (GDP) portion as a function of the process chemistry used, but the process chemistry itself is undefined by the claim. Therefore, the GDP portion is itself left undefined by claim 1. As it is presently written, the scope of claim 1 would change when the process gas chemistry was changed. A similar problem exists with respect to claim 8. In claims 1, 5, 6, 12 and 15, the phrase "over the entire operating life of the gas distribution plate" is vague and indefinite because it defines the GDP portion as a function of an unknown variable. The operating life of the GDP is an arbitrary period of time because a future operator of the semiconductor fabrication apparatus can choose to dispose of the GDP at any time for any reason that he desires. In claim 5, line 2, "defect particles" is vague and indefinite because the specification discusses "particle defects" rather than "defect particles". Claims 1 and 8 are vague and indefinite because they appear to be in conflict regarding the reactivity of the GDP with the process gases used with the GDP. Claim 8, which depends from

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claim 1, describes the GDP as reacting with the process chemistry used, which is in direct conflict with the claim 1 limitation of the GDP being substantially nonreactive with the process gases.

This raises the question of exactly what "substantially nonreactive" means in claim 1. Applicants' specification indicates that the type of GDP disclosed by applicants through time becomes too thin to be used and must be discarded. How can this fact be compatible with the limitation of claims 1 and 12 that the GDP is substantially nonreactive with the process gases for the entire life of the GDP? Also in claim 8, the phrase "the plasma processing chamber" lacks proper antecedent basis in claim 1 or claim 8. In claims 38-39, use of the word "may" is vague and indefinite. Also in claim 39, the phrase "micro-defects about 50 micrometers" is unclear. Does this limitation refer to length or depth or mean size or median size, or something else?

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-18 and 38-39 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Maydan (5,746,875). Maydan discloses a GDP for use in a plasma etch apparatus, wherein the GDP is constructed of a ceramic of the type recited in present claim 10. The GDP is treated to remove surface defects, in order to eliminate particle defects when the GDP is used for wafer processing. While Maydan's gas distributor is composed of parts, he clearly identifies it as being a plate (see, for example, Fig. 6A and col. 7, line 11, "blocking plate assembly 69") having a plurality of holes. Maydan discloses (col. 5, line 58 to col. 6, line 19) that polishing procedures achieve a defect free smooth surface on each piece. Regarding the step of heating recited in claims 3 and 15-18, it is noted that these claims are product-by-process claims and will be treated in the manner described in MPEP 2113. As stated therein, the use of 35 U.S.C. 102/103 rejections for product-by-process claims has been approved by the courts. "When the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable", *In re Brown*, 173 USPQ 685. Regarding claim 7, it is noted that Maydan's Figs. 18 and 20, for example, show a part (330' for example) having a gas distribution groove in its back face, while Maydan indicates at col. 5, line 64, that his parts are machined, so it is inherent or at least obvious that the groove in part 330' of Fig. 18 can be formed by machining.

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Claims 1-6, 8, 12-16, 18 and 38-39 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shang. Shang discloses a GDP (see col. 6, lines 5-17 and 48-58, and col. 7, lines 1-23 and 40) for use in a plasma etch apparatus, wherein the GDP is treated to remove surface defects, in order to eliminate particle defects when the GDP is used for wafer processing. Shang discloses a step of heating the GDP to 100° C (col. 6, line 50) or 350° C (col. 6., line 58), which explicitly meets the limitations of claims 3, 15 and 16. Regarding product-by-process claim 18, there is no physically distinguishing feature discernable between the GDP disclosed by Shang and the GDP recited in claim 18.

Claims 1-18 and 38-39 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wicker I (5,993,594). Wicker discloses a GDP made by hot pressing silicon nitride at a temperature above 1500° C (col. 7, lines 34-38). Wicker teaches (col. 3, lines 33-42) that his GDP results in much reduced particulate generation and much lower rate of chemical reaction with process gases. In view of the product-by-process nature of applicants claims, the GDP of Wicker is prima facie not distinguishable from the presently claimed GDP.

Claims 1-18 and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wicker I (5,993,594), Chen (5,824,605) or Wicker II (5,863,376), taken in view of Maydan (5,746,875) and/or applicants' description of the prior art. Wicker I and II and Chen all disclose ceramic GDPs which are sintered at high temperature during fabrication. Maydan teaches that it is desirable to polish a ceramic GDP to remove surface defects and thus reduce contamination due

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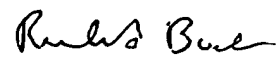
to erosion or corrosion during wafer processing. It would have been obvious to one skilled in the art to polish the ceramic GDP of Wicker I or II or Chen in view of Maydan's teaching that polishing a ceramic GDP will reduce contamination during wafer processing. Furthermore, applicants' description of the prior art discloses that it was a conventional practice in the prior art to season a GDP in a reactor for 10 hours (see last paragraph of page 2 of applicants' specification). It thus would have been obvious to one skilled in the art to season a GDP such as that of Wicker I or II or Chen or even Maydan in order to further reduce particulates if so desired. Applicants' product-by-process as presently written do not distinguish over such a seasoned prior art GDP in any discernable way. It is noted that seasoning by operating the processing chamber for 10 hours is a high temperature process which inherently heats the GDP (see col. 6, lines 30-31 of Wicker II for example), at least to the extent recited in claims 3 and 15-16.

Applicants' arguments have been considered but are not applicable to the new grounds of rejection.

The amendment filed October 2, 2000, added two claims, both numbered 38. Therefore, the second of these claims has been renumbered as 39.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (703) 308-1895.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


RICHARD BUEKER
PRIMARY EXAMINER
ART UNIT 1763